Department of Water and Power
City of Los Angeles

Advanced Metering Infrastructure / Smart Grid Project

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Implementation Strategy

- Open, non-proprietary communications with easily interchangeable components throughout AMI system
- "Plug and play" – a new device would be able to register itself upon installation and immediately begin to communicate with neighboring systems
- Minimize impact of communication technology change by installing a scalable RF mesh and IP backbone network using public communication network
- Provide access to home premises for high energy residential consumers to monitor and control electric load with "off-the-shelf" network devices
- Design a flexible AMI / Smart Grid foundation for future technology standards, system interfaces, and regulatory requirements

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AMI Five Year Full Implementation Plan

Goals:

- Infrastructure shall support multiple core functions beyond meter reading, including distribution operations, system reliability, energy efficiency, and customer services, etc.
- Minimize O&M costs
  - Automate Meter Reading
  - Improve Customer Service
  - Automate Outage Management
- Improve rate design and analysis capabilities

Metering Plan:

Implement a flexible AMI plan that can work with any communication medium

- Wireless (Public Network) two way communication meters
  - 25,000 large and medium Commercial and Industrial customers – equipped with TOU, power quality, outage notification, and web presentment functions
  - 64,000 residential customers with monthly energy consumption over 1,200 kWh – equipped with ZigBee protocols to monitor and control home electric devices
  - 10,000 identified high turn over residences – equipped with remote turn on / off functions
  - 2,500 critical care residential customers – equipped with outage notification function
- Walk-by or drive-by (RF) one way communication meters that can be upgraded to fixed network or RF mesh network configurations
  - 180,000 small commercial with RF demand meter
  - 1.1 million residential RF meters
  - 674,000 water ERT modules

AMI Benefits

- Remote Turn-on/off
  - *Research metering technologies to provide turn-on/turn-off remote capability*
  - *Beneficial in high transition and high crime areas*
- Calendar Month Billing for Large Customers
  - *Provide customers billing schedule option consistent with available interval data*
  - *Improve cost management for customers*
- Improve Safety
  - *Install AMR meters in difficult to read areas (i.e. locked yards, dogs, gangs)*
- Special Rates
  - *Enhance ability to provide special rates such as Critical Peak Pricing, Net Metering, and Load Curtailment*
- Improved Customer Services
  - *Provide the Department the ability to detect power outages*
  - *Support Energy Efficiency programs via AMR and web capability*
  - *Support proactive services to our Critical Care Customers*
- Support Energy Efficiency Programs
  - *Provide audit data for all large and medium commercial and industrial customers*
  - *Support home energy management 64,000 residential high energy consumers*

Value of Public Wireless Network

- Over 70 Billion dollars of North American investment over the last two years
- Hundreds of Billions of dollars of global investment in public wireless ecosystem
- Coverage everywhere and improving
- Available bandwidth to support advanced metering transactions and customer communications
- No capital required to build out or support network infrastructure
- Targeted or mass deployments economically viable
- Highly scalable, reliable and secure
- New technology standards are backwards compatible
- Future-proof investment in technology – robust infrastructure growth opportunities

Compare Network Investments

Technology	2006 Endpoints	2010 Endpoints	2007 Investment	Cumulative 2007-2010 Investment
BPL	30,000	400,000	$50,000,000	$200,000,000
Mesh	40,000	5,000,000	$100,000,000	$400,000,000
Proprietary RF	12,000,000	12,000,000	$100,000,000	$400,000,000
Public Wireless	2,800,000,000	3,500,000,000	$30,000,000,000	$120,000,000,000

Recommended AMI/Smart Grid for State Wide Implementation Policy

For Commercial and Industrial Customer Demand Level over 30 kW:

- Public wireless network
- Two way communication
- "Plug and play" – a new device would be able to register itself upon installation and immediately begin to communicate
- Remote load control
- Time-Of-Use
- Power outage notifications and power quality events
- Fifteen minute interval data and web posting
- Net metering, Co-Gen, and kVar selective functionalities

Recommended AMI/Smart Grid for State Wide Implementation Policy

For Residential Customers Monthly Usage Over 1200 kWh:

- Public wireless network
- Two way communication
- "Plug and play" – a new device would be able to register itself upon installation and immediately begin to communicate
- Home Load Management
- Time-Of-Use
- Net metering

For Critical Care Customers:

- Public wireless network
- Two way communication
- Power Outage Notifications

For High Turn Over Area:

- Public wireless network
- Two way communication
- Remote Turn on/off